Ontario

fish and wildlife Review

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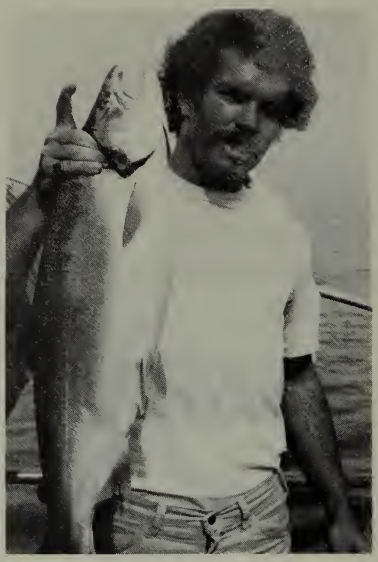
Ontario



"Future Shock," people like to say, but in our circles the future is here and the shock is present.

White-tailed deer are down, away down, but their future is seen as bright. Page 3.

Lake Ontario fisheries fell from riches to poverty, but Pacific salmon show recovery is on the way. Page 8.

The moose-moving business is on the upswing (Page 17) and things are looking up for Komoka Creek (Page 21).

So our 19th year begins on an upbeat, but we still have to do something about the pigeons. Page 20.

Front Cover—Erika Thimm caught two coho turning together in the air as they prepared to leap a falls on the Credit River.

Back Cover—Allan Wainio shows fisheries staff adding male milt to coho eggs from fish taken above the falls.

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Ontario Fish and Wildlife Review is published quarterly by the Ministry of Natural Resources (Fisheries Branch and Wildlife Branch), Toronto, Ontario, M7A 1W3. Material herein may be reprinted provided credit is given to the author and this publication. Editorial committee: F.P. Maher, J.L. Tiller, A.A. Wainio and L. Whistance Smith.

The goal of the Ministry of Natural Resources is to provide opportunities for outdoor recreation and resource development for the continuous social and economic benefit of the people of Ontario, and to administer, protect and conserve public lands and waters.

Ontario Ministry of Natural Resources

Hon. James A. C. Auld
Minister

Dr. J. K. Reynolds
Deputy Minister

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'Review' editors, left to right: Laurel Whistance-Smith, Jim Tiller, Frank Maher and Allan Wainio.

Here we stand

Ontario Fish and Wildlife Review is the only medium devoted to fish and wildlife management in Ontario. With the support of resource managers and research scientists, we aim to make it a happy medium between technical and popular language. The catalogues label it "semi-technical."

'Review' is addressed to the outdoors fraternities. We know that some readers have an excellent knowledge of resources and can often speak on equal terms to professional managers in their chosen fields. We know that larger groups, to varying degrees, have a general understanding of the natural environment and how they can help to overcome its problems. And we know that other large groups enjoy the outdoors in an innocent way and know little or nothing of their obligations to the natural world.

We hope to interest and inform Ontario's outdoors people and, of course, many an upcoming student of natural history or science.

'Review' was first given to an unimpressed world in 1961 and now we are 18 years of age and old enough to vote. No problem. We shall always vote for. . .

A blade of grass
A paw print
A bird call
A trickle of clean water.

INTROSPECT

A personal opinion
not necessarily endorsed by
the Ministry of Natural Resources

The foreman's verdict

by Wayne Mutton
Information Officer, Central Region

Hunting and trapping are on trial these days and I've just elected myself spokesman for the jury—the silent majority who make up about 80 per cent of the population. We're the people the politicians will consult when the time comes.

Like most juries we got dragged reluctantly into this case. We don't know much about the facts or issues and we're confused a lot of the time. Often, both sides of the argument sound equally sensible.

But, hey, biology and St. Francis of Assissi aside, your "style" of presenting your cases is antagonizing we, the jury. I mean, we may not be experts but we've bought a few used cars in our time.

Actually, we ride the bus to work. Know what we have to read on billboards to pass the time? Forty Raccoons Have to Die in Agony to Make One Fur Coat. Now you might have a point about the coat—but in agony? Couldn't at least five have died in mild discomfort?

What about the other 40 raccoons who died in big city neighbourhoods because they messed up people's garbage. Where's their billboard? Let's be fair about this.

And those letters to the editor with messages such as "My country's wildlife is being murdered and I am appalled." Murdered? Really?

Another thing. A lot of impressionable school kids are running around, saying beavers, wolves, bears, meadow voles and you-name-it are "endangered." Beaver endangered? That'll be good news to all the farmers with flooded fields.

And while we're on farmers and "murderers of wildlife," you guys shouldn't forget that some farmers like to use groundhogs for target practice. But who complains? Sounds like there's one law for togged out hunters and another for the sentimental favorites. Yeah, we know. Farmers are groovy.

Finally, some of you animal lovers pile the moral superiority on a little thick. And that's not scoring any points with the folks sitting around the chrome set in the kitchen.

But some of you proselytizers with the traps and guns aren't much better. We're tired of being cornered by you guys with the broken record entitled "It's Man's Natural Urge to Hunt." No way. Man's natural urge is not to starve. That other stuff went out with clubs and loincloths.

We're sick of all those outdoorsy stories that start out with a bargain-basement Hemingway description of dawn breaking. They're all about Joe, Eddie, Tip, Rebel and all the guys and dogs who froze at the Ole Hunt Camp but never forgot it. Brings tears to the eyes.

We may spend Saturday mornings at the supermarket with the wife and kids but we get the message that's sort of tucked between the lines: "Hunt or never know the true meaning of God, Nature, Life or Real Manhood."

We don't buy that. Real manhood is not crying when the fuel bill comes in. And a lot of us have communed with God and/or Nature while sitting on the back stoop in the city, listening to the birds wake up. Some of those Saturday night parties can go on forever.

"I don't really care if I don't get anything when I go hunting—it's just getting out there, enjoying the glories of nature." Now there's a classic. The trouble is we usually hear it when you don't get lucky.

You both have some people who are hurting your credibility and drowning out saner souls. Won't some of you—on either side—concede a point or two—publicly? It would certainly make things easier for the rest of us.

Ganaraska rainbows

The Ganaraska River at Port Hope provided good trout fishing during the fall. A creel survey indicated that 2,000 rainbow trout were taken by anglers between September 15 and November 30. The average size was three pounds but several rainbows weighed more than 16 pounds.

Harsh winters reduce the deer herd. —Photos by Erika Thimm

Deer Management in Ontario—The Future

A statement by the Provincial Deer Management Committee

Since the mid-1950s, the number of deer in Ontario has decreased by almost 70 per cent. Why? In 1975 the Ministry of Natural Resources began an intensive study of the causes of this decline. The current problems faced by Ontario's whitetails are:

- Generally colder winters with slightly deeper snow
- Overharvest by legal hunters and no adequate system in place to reduce harvest
- Losses due to poaching
- Important losses due to wolves and dogs at specific times and in certain areas
- Deteriorating habitat conditions in certain traditional deer hunting areas.

During the winter, when deer are confined to conifer shelter areas, long periods of low temperatures use up their energy supplies, and deep snow makes it difficult for them to obtain sufficient browse. Harsh winters may also reduce the number of fawns born the following spring. Undernourished females cannot produce healthy, robust fawns.

Since the mid-1950s winters have become slightly colder and the average snow depth has increased. Exceptionally severe winters in the late 1950s and throughout much of the 1970s killed many deer.

More than 100,000 licensed deer hunters enjoy some 450,000 days of recreation annually and contribute more than 25 million dollars to the provincial economy.

In a few areas hunters take less than 10 per cent of the deer population but, in much of Ontario's traditional deer hunting range, they take up to 25 per cent of the herd. The harvest has been as high as 40 per cent in some areas (e.g. Bracebridge).

Other state and provincial agencies have found that deer populations start to decline when more than 10 to 15 per cent of the does are harvested. Also, as the number of deer decreases, hunters become less selective and take a higher proportion of the remaining animals.

In the past, attempting to reduce the

harvest by shortening the hunting season has only been partially successful. Fewer hunting days increase hunter density and often decrease the quality of the hunt. Furthermore, the total kill is often not significantly reduced.

Hunter-landowner conflict has resulted in the loss of hunting opportunities in agricultural southern Ontario even though deer are abundant. Archery seasons have been established in some areas, but the rapidly increasing deer herd in the south is still being underharvested. Some of the gun hunters, who traditionally hunted in the south, now travel to central and northwestern Ontario, increasing the hunting pressure in these areas.

The number of deer taken by poachers is difficult to assess. In some areas it may exceed the legal kill, but in most areas deer managers believe it is less than the legal harvest. On Manitoulin Island, limited data suggest that the loss to poachers approaches 10 per cent of the herd in some townships. Deer taken by poachers are not available for legal harvest or viewing, and the loss can significantly depress the population.

Wolf predation on white-tailed deer is a natural situation in much of Ontario and usually removes less than 10 per cent of the herd each year. However, certain snow crust conditions may allow predators to travel on the snow but cause deer to flounder. Deer are particularly vulnerable when they concentrate in winter, and wolves have been known to have eliminated the deer from some deer yards.

Dog harassment and predation are serious problems when deer concentrate near populated areas or farms. Both domestic and feral dogs have been responsible for eliminating deer from some areas.

Before European settlers arrived, whitetails were found primarily along the shores of Lakes Erie and Ontario, in small pockets scattered throughout southern Ontario, and to a lesser extent in central Ontario. Then, as land was cleared by the early settlers for agriculture, and the forest cut for lumber and fuelwood, better deer habitat was created. In the same period, numerous slash fires also stimulated plant growth on the forest floor. Adequate winter shelter was left for the deer because of the low demand for conifers of poorer quality. The result was a drastic increase in deer populations.

In the 1920s and 1930s deer were very abundant throughout southern, central and northwestern Ontario, but populations did not peak in some areas until the 1950s. In agricultural southern Ontario, deer populations continue to increase.

In the past three decades, the continued cutting of conifer shelter and the maturation of hardwoods have resulted in the deterioration of habitat quality. Deer habitat is not as good as it was earlier in the century.

What are the solutions?

A complete deer management program to solve our problems should emphasize:

- Improved control of harvest
- More enforcement
- Selective predator control
- Enhanced habitat management
- Improved data collection & analysis
- Improved research.

Control of harvest

Under existing habitat conditions, the range will support considerably more deer than are present now. To allow the population to increase, hunter harvest must be controlled.

What kind of system should be used? It must reduce the kill in a predictable manner; it must be flexible so it can be adjusted to different areas; it must preserve the traditional ways of hunting as much as possible; and it must maintain hunting opportunities and enhance them in the future.

The Ministry examined many different techniques, including the following:

- Closing or shortening seasons
- Harvesting bucks only
- Controlling number of hunters
- Controlling number of deer killed
- Controlling harvest of antlerless deer (selective harvest system)
- Changing the timing of seasons
- Requiring hunters to select animals of specific age and sex
- Regulating hunting methods (e.g. restrict party size, restrict use of dogs, restrict weapon types).

Landowner attitudes prevent the harvest of abundant deer in some areas.

The selective harvest system is the most appropriate option for improving harvest management in Ontario at this time. It will provide a season wherein all hunters may continue to hunt antlered deer. At the same time, a limited number of hunters will be allowed to harvest antlerless deer to regulate herd size.

In areas where the objective is to increase the size of the herd, the number of antlerless deer harvested will be low; and where the herd is at or above the desired level, the number will be increased. This system gives maximum flexibility for deer managers to meet local situations while maintaining a maximum level of hunting opportunities.

Legal deer harvest in agricultural southern Ontario is very low and achieved primarily through primitive-weapons seasons and controlled hunts. However, the herd is still increasing at an alarming rate. The development of gun seasons, using a harvest system acceptable to landowners, has been successful. The principal elements of such a system include control of hunter numbers, restrictions on weapons, and landowner preference.

Enforcement

Poaching affects deer herds and is a major stress in some areas. Enforcement will be increased in problem areas.

Implementation of a selective harvest system and controlled hunts, and increased control of dogs, mean additional enforcement effort.

Enforcement cannot be effective without active public support. The Ministry is developing means of encouraging more public involvement in the enforcement of game laws.

Selective predator control

Selective predator control is needed in many parts of the Province. Control is most

effective when it reduces specific predator populations somewhat before, or during, the winter deer-yarding period when predation is most severe. This control may not reduce the year-to-year wolf population, but this is not necessary to effect a reduction in winter deer losses. Predator management should attempt to keep the winter wolf-deer ratio at less than one wolf to 140 deer.

Control of dog predation and harassment during winter and spring is essential. A public information program can be effective along with additional enforcement effort directed towards dogs and their owners.

Habitat management

The long-term future of deer herds in Ontario will be strongly influenced by changes in forest vegetation. In particular, the modification of timber harvest practices can provide an effective method of producing good habitat for deer.

Habitat management includes winter range management, summer range management and winter emergency work.

Winter range management involves the cutting of trees and shrubs to promote future food production, and the protection, improvement and creation of winter shelter.

Winter emergency work includes cutting browse for immediate use, breaking trails and supplementary feeding.

Summer range management consists of creation or maintenance of forest openings, prescribed burns, and management of beaver-flooded areas.

As the deer herd recovers, the need for habitat improvement in certain areas will be more clearly identified. Some areas are known to need increased effort now, while other areas, which might benefit from intensive management, can be identified only after deer numbers increase.

Data collection and analyses

There is little use in making management changes unless we can measure the results. The analyses resulting from a co-ordinated data collection system will be used to modify the management program to meet the changing needs of the resource, itself, and the resource users.

Information on the animals, their habitat and the users will be collected. Some examples follow:

- Deer population estimates
- Legal and illegal deer harvest information by ages and sex
- Non-hunting mortality statistics
- Information on reproduction
- Effects of predation losses and assessment of predator control programs
- Deer condition data
- Data on habitat quality and quantity
- User surveys.

Such information can tell us about the effectiveness of the management measures, and it will also be useful in building predictive models which give a good indication of the future structure of the herd.

Research program

Management-oriented research must be an integral part of a deer management program. Many biological and social conditions are specific to Ontario and, therefore, can best be addressed by research projects carried out in Ontario. Research will examine such subjects as deer productivity, harvest methods and their impact, habitat requirements, predation and poaching.

Summary

The solutions to deer management problems are complex and will cause some problems of adjustment for hunters. Yet, if we are to manage the resource carefully and ensure that deer will be present for many years to come, changes are necessary.

The selective harvest system allows everyone to continue hunting, and if everyone co-operates, deer herds can rebound. Habitat improvement, enforcement and selective predator control can enhance the deer management program to increase deer numbers.

The thrill of a child seeing his or her first buck or the pleasure of an angler, who watches a doe step cautiously from the forest, are irreplaceable. The future of white-tailed deer in Ontario is bright, but reaching our goals will require the co-operation and support of all concerned people.

Deer are vulnerable to wolves when they congregate in winter yards.

The deer harvest varies from less than 10 to 40 per cent of the population.

Pacific salmon's role in Lake Ontario

Report and photos by Allan Wainio
Extension Biologist, Fisheries Branch

LAKE Ontario, which once yielded a million pounds a year of lake trout, salmon, whitefish and herring, should not be ignored and allowed to remain unproductive.

The abundance of fish in Lake Ontario astounded the early explorers and later the settlers. The earliest descriptions reported huge spawning runs of trout, salmon and other fish in estuaries, tributaries and shoals. In the early days the Atlantic salmon and the lake trout were the dominant predators in the lake.

Lake Ontario fish was a primary source of protein for the early settlements and military outposts; the value of fish runs sometimes determined the value of land. Commercial fishermen took large harvests to supply extensive and hungry markets.

As recently as 50 years ago, communities on the Great Lakes held large lake trout derbies in early spring. These were happy social events which attracted large numbers of people. The returning fishermen were proud of their bounteous catches and everyone feasted on the lake trout.

But the growth of the human population in Ontario resulted in the progressive loss of fish populations in many waters. In Lake Ontario, the major stocks of lake trout, lake whitefish, lake herring, sturgeon and Atlantic salmon collapsed; some species disappeared entirely.

The stresses which caused these losses also operate in most of our inland waters. The three major stresses are overfishing, exotic introductions and aquatic deterioration—acting separately or in combination.

Overfishing

By 1840 the Atlantic salmon stock of Lake Ontario had collapsed; it was overfishing which helped considerably to wipe out this important commercial species. The lake trout, whitefish and herring remained abundant until the 1930s but were in serious decline by the 1940s. The lake trout disappeared altogether in the 1950s. The decline and disappearance of fish species in Lake Ontario is a testimony to the potential of the commercial industry to disrupt aquatic communities.

Commercial quota regulations, restocking and sea lamprey control can produce a noticeable upswing in trout catches in the 1980s.

Exotic introductions

Three marine species—alewife, sea lamprey and smelt—spread throughout most of the Great Lakes and seriously disrupted native fish communities. Despite undergoing huge population fluctuations in the past decades, the alewife is the most abundant fish in Lake Michigan. The sea lamprey's effect on lake trout stock has been disastrous and well-recorded. Smelt and alewives crowded out native fish species such as herring and shiners.

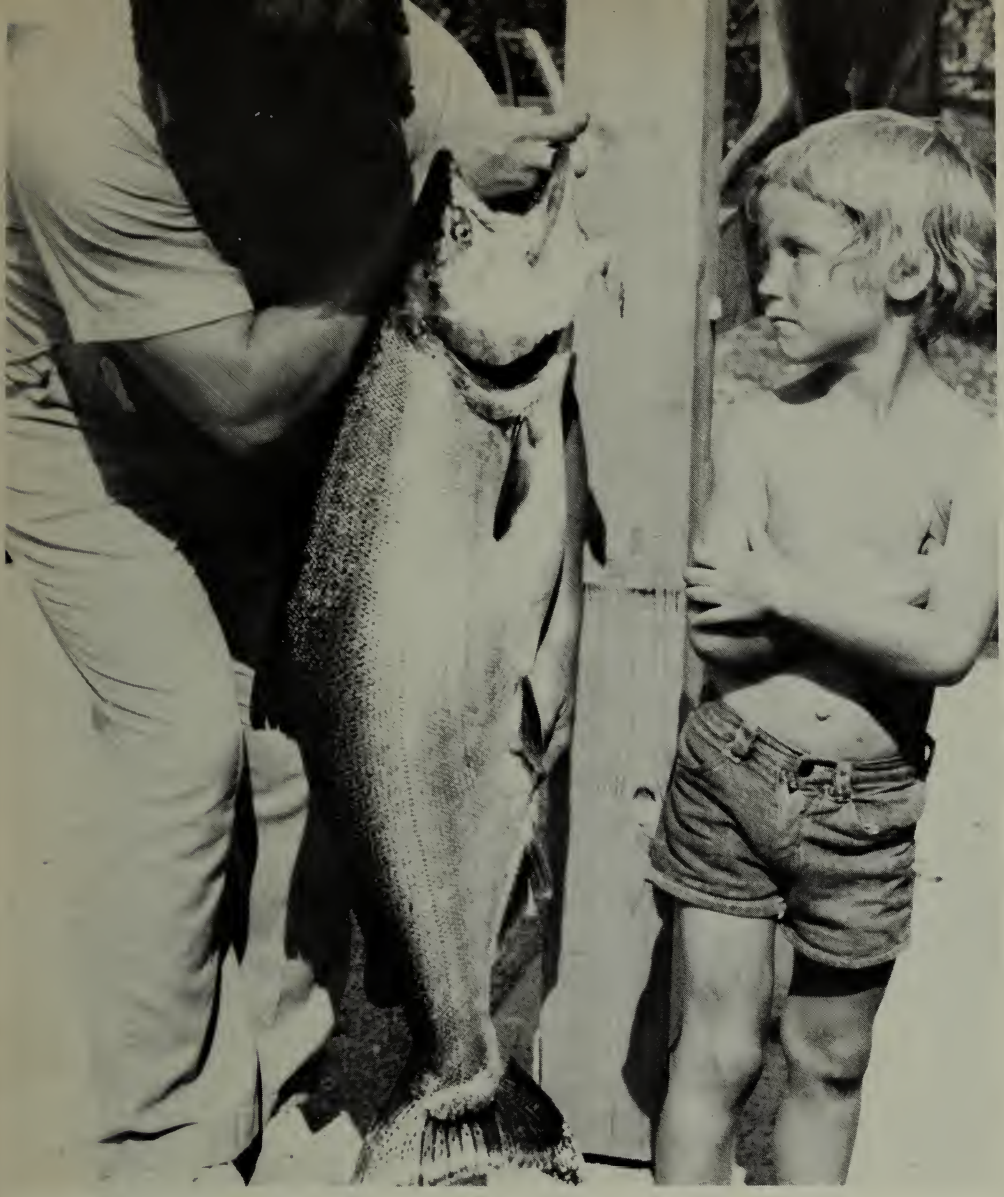
Water quality and habitat deterioration

The full impact of the changes in water quality of the Great Lakes was not felt until the mid-1900s when human population growth and industrialization caused rapid physical and chemical changes. As a result the presence or productivity of aquatic life, including desirable fish, was seriously curtailed and sometimes destroyed. Nutrient abundance, turbidity siltation, loss of shallow areas, increasing water temperature and chemical introductions are the major factors contributing to the lowering of water quality.

The present—an interim approach

Since the late 1940s the agencies of governments bordering the Great Lakes have worked actively to rehabilitate the fishery resources of this convoluted inland sea.

With fish stocks on the decrease, and with the inland waters unable to supply the



A chinook "as big as me."

demand for sport fishing, it was logical to take a new look at the Great Lakes.

With no large predator remaining, and with a swarming forage fish base developing, there was a need for a fast-growing predator (such as the coho salmon) until a native predator (such as the slow-growing lake trout) could recover.

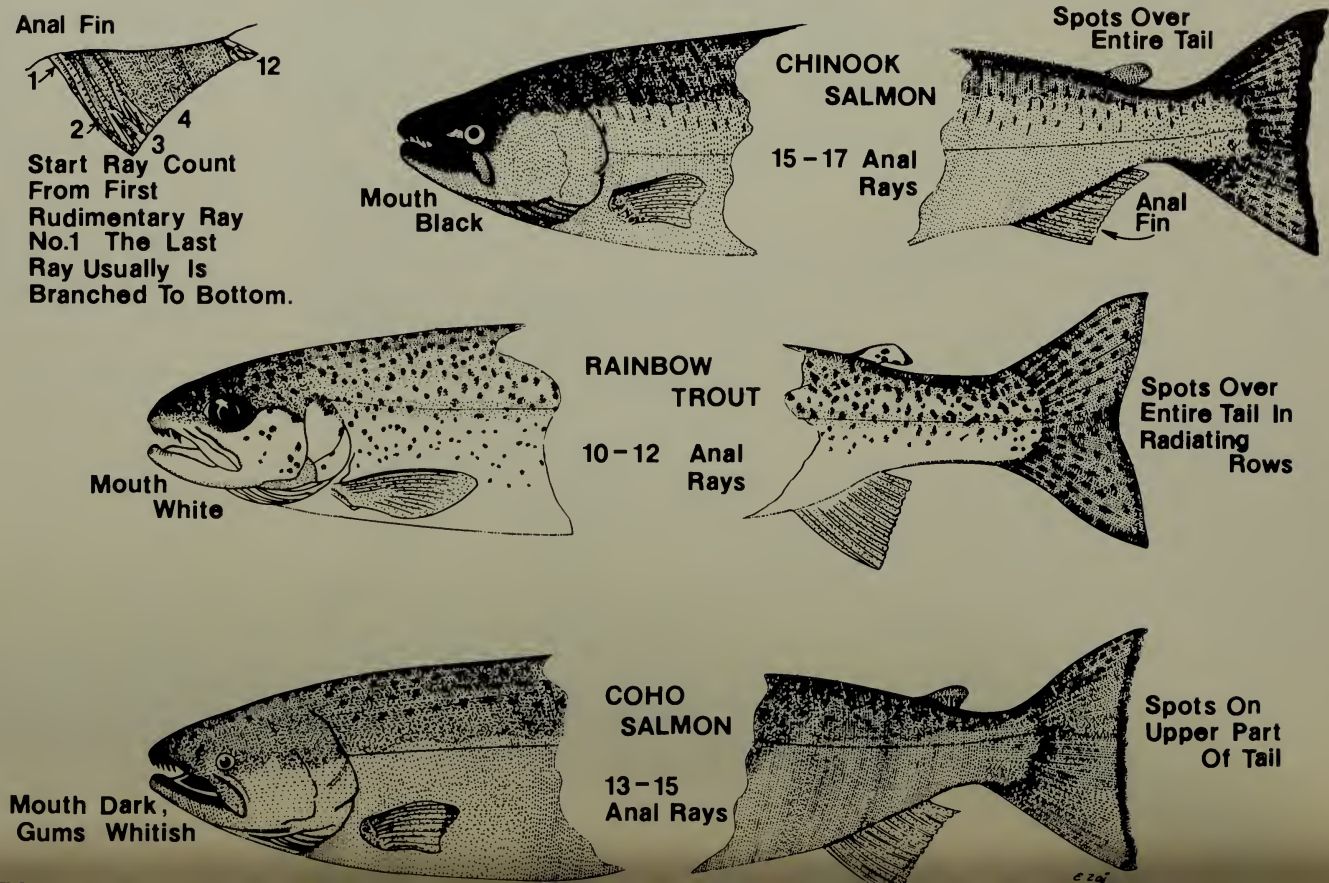
With the sea lamprey coming under control, a large predator had a chance to survive.

In the mid-1960s the State of Michigan began stocking coho and had remarkable success. The introduction of Pacific salmon was just one step in the over-all Great Lakes rehabilitation and management program now being pursued by all agencies surrounding this important freshwater basin.

Why Lake Ontario?

In 1969 the Ministry of Natural Resources began stocking Pacific salmon in the Credit River, Bronte Creek and Humber River, tributary streams in the western basin of Lake Ontario. At that time, the lower reaches of the Credit and Bronte streams were marginal for other trout species and thus coho would not conflict with any established sport fishery. From the begin-

IDENTIFICATION OF CHINOOK SALMON, RAINBOW TROUT AND COHO SALMON.



A coho taken in early September.

ning these stockings were considered experimental and temporary.

Besides testing the renewed suitability of Lake Ontario for large predators such as salmon, the Ministry also wanted to assess the sea lamprey control program begun in 1971. We now have lamprey scarring rates before and after the chemical control treatment.

Furthermore, the plantings were adjacent to urban centres, giving the Ministry an opportunity to evaluate the demand for fishing close to home. Thus, the program would provide immediate fishing opportunities of a short-term nature while waiting for cleanup and eventual rehabilitation of naturally reproducing species.

The choice of coho and chinook salmon was a practical one. The techniques of artificial hatching and rearing were well known and at that time eggs were readily available. Furthermore, the states south of the Great Lakes had demonstrated that stocking of coho or chinook could produce substantial fishing if sea lamprey were reduced.

During the first four years of the salmon program, the eggs came from Lake Michigan stock. These proved to be of poor quality so the Ministry turned to the west coast for eggs.

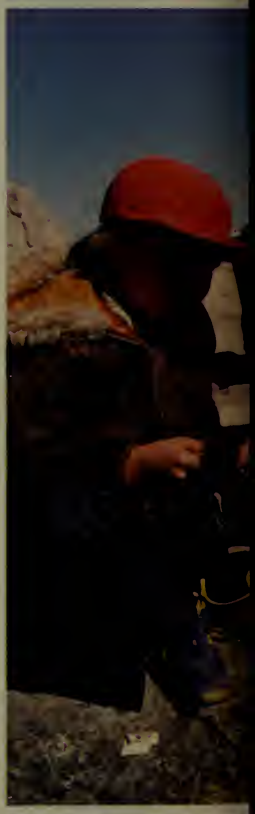
The eggs were hatched at the Wiarton hatchery in the Bruce penninsula and the fry were transferred to the Chatsworth hatchery, just south of Owen Sound, where they were raised for 12 to 14 months to the smolt stage at which young salmon are ready to migrate.

Most of the coho smolt have been stocked annually in the Credit River. Bronte Creek has also received some each year. Other sites, such as the Niagara River and smaller creeks in the western basin of Lake

Summer fishing on Lake Ontario; this coho scaled 11 pounds.

Down-rigger equipment; green cannonball takes line to desired depth.

Many anglers fish the C



Fishing for salmon at

ver; these salmon seekers tried their luck at Streetsville in the early fall.

uth in early September.

River catch in October. Notice dark color.

Ontario, have received some plantings in recent years.

The first stocking of chinook in the western end of the lake occurred in 1974 in Bronte Creek. Initially, stocking of chinook did not occur annually as it does now.

Kokanee salmon were stocked in the 1960s but these plantings did not succeed. In 1979 pink salmon found their way into Lake Ontario from the upper lakes where they have been reproducing successfully since the late 1950s. The pinks may be here to stay.

Spawning runs

Before heading up their parent stream to spawn, the coho mill about in Lake Ontario just off the river mouth. A heavy rain will often start a mass movement upstream. The run may begin in late August but the heavy runs are between mid-September and mid-November and some are still trickling upstream in December. Some survive until January or February but by then they are quite black and frayed.

In the Credit River, salmon can now bypass the Streetsville dams and swim upstream as far as Norval. Because they were raised in a hatchery, their homing instinct is rather blunted, and small numbers migrate up other streams.

Coho spawn upstream but do not produce enough young—if any at all—to sustain a sport fishery. For that reason artificial hatching and rearing are necessary.

In 1970, before sea lamprey control began, the salmon killed by lamprey were washed up on beaches along the Lake Ontario shoreline, and some fish had as many as 14 lamprey marks. By 1977 lamprey scarring had declined to less than one mark per fish on the average.

The sport fishery

In the spring the south shore of Lake Ontario generally warms up much sooner than the northern shore of the western basin. The warmer water and the spawning runs of alewives and smelt probably attract many of the lake's coho which now weigh from two to three pounds. As the smelt and alewives leave the shore area, the coho appear to follow them to deeper water. A popular salmon fishery has developed in the southern part of the western basin with peak activity between mid-April and mid-May.

Coho have also been caught at other sites such as the two waterfront generating stations on either side of Toronto where there are concentrations of smelt and other fish.

In the late summer and early fall, salmon are fished throughout the western basin. In their many boats equipped with heavy fishing equipment, excited anglers roam the open waters of the lake in search of the wide-ranging salmon.

The salmon are deep below the surface and fishing with downrigger equipment is the only way to catch them. The anglers know the coho's preferred temperature is 54°F and they use temperature probes to find their level.

On Lake Ontario it is unwise to venture far from shore in small boats because the mood of the lake can change in minutes.

When the salmon are just off the river mouths, they are concentrated in large, loose schools close to the surface and will hit a variety of lures offered by those who are surface trolling.

There is no closed season on Pacific salmon. Anglers can fish for coho and chinook all year round in Lake Ontario and in tributary streams except where there are sanctuaries. The creel limit is five salmon per day.

Angler behavior

Special sanctuaries in the lower reaches of the Credit River had to be imposed to control the hundreds of anglers who descended on the river.

Fishermen were so excited by the heavy salmon runs they put aside respect for private land and fishing regulations. The trespassing, vandalism and abusive confrontations aroused the indignation of landowners and condemned the fishing fraternity in the minds of many residents.

Just what did the anglers expect? The pursuit of fish does not give them the right to trespass on private property. It will take a lot of hard work by future anglers to redeem their reputation in the lower Credit River area.

Contaminants

Man-made compounds have shown up in the salmon. Tests carried out by the Ministry of the Environment have revealed that the contaminants PCB (polychlorinated

Patience awaits reward.

biphenyls) and mirex exceed the health guidelines of 2 ppm in coho over 20 inches.

The Ministry has recommended that anglers catching and eating coho salmon should restrict themselves to occasional meals which means one or two meals per week, and only for a three-week period. Children under 15 and women of childbearing age should never eat fish with restrictions on them.

Much of the contaminants are stored in the fat deposits of fish and, therefore, as much fat as possible should be removed before cooking.

These and other contaminants, such as mercury and DDT, have never been detected in sufficient quantities to make Ontario waters unsafe for recreational use or as a source of treated drinking water.

Fish diseases

Infectious pancreatic necrosis virus (IPN) has been positively identified in stocks of coho salmon coming from Lake Ontario. The virus causes a serious disease in many species of trout and salmon and poses a danger to wild fish populations and stocks in private and government hatcheries. It can be carried by the egg and transmitted to the next generation of salmon.

There are strong movements within many responsible agencies to stop the spread of serious fish diseases and to eradicate them if possible. This reflects the advice given for years by independent fish health specialists (here and elsewhere) that we must make greater efforts to control and eliminate serious diseases.

Egg supply

In 1977 new federal Fish Health Protective Regulations under the Fisheries Act of Canada prohibited the international and interprovincial transport of uncertified eggs.

No stocks of coho or chinook salmon from either the west coast or the Great Lakes states could be certified free of certain diseases.

Since the fall of 1977 the Ministry has collected coho and chinook eggs from the Credit River and Bronte Creek salmon.

The future

Providing fishing close to urban areas by artificial means is sometimes desirable. But the effect of such projects on the entire provincial hatchery program has to be seriously evaluated. The Ministry of Natural Resources is responsible for fisheries management in the Great Lakes and in more than 250,000 lakes and uncounted miles of streams. It is possible to manage only a fraction of these waters intensively so the Ministry must set priorities for fish stocking consistent with its production capacity.

As a result the Ministry is shifting its emphasis to native and established species. The best way to balance the ecosystem is through naturally reproducing stocks of fish species adjusted to each other.

Each spring since 1976 the Ministry has stocked fingerling lake trout in Lake Ontario just offshore near Clarkson, west of Port Credit. This is an attempt to bring back the native lake trout which flourished in this end of the lake as recently as the 1930s. Some of these lake trout showed up as four- and five-pounders in the fall of 1979.

Lake trout are also being stocked in the east end of Lake Ontario where much better spawning shoals exist.

At the same time as the lake trout stockings, the Ministry planted rainbow trout yearlings in the Credit River to establish a natural reproducing run of adult rainbows

similar to those occurring in rivers of southern Georgian Bay. Some adult rainbows returned to the Credit River in the spring of 1978.

In the near future the Ministry will again be raising brown trout in one of its provincial hatcheries and some of these will be destined for the western basin of Lake Ontario to provide an inshore fishery for anglers.

Atlantic salmon, once native to Lake Ontario, have been absent for more than 100 years. Recent surveys have shown there are only five tributary streams on the Canadian side of the lake which may yet be suitable for Atlantic salmon spawning and production of fry. There is a possibility that Atlantic salmon may be considered for Lake Ontario provided, of course, their required habitat does not deteriorate further.

In the future the Ministry of Natural Resources has the following responsibilities towards the fisheries resources of Lake Ontario.

(1) To protect the productivity and diversity of desirable native fish stocks.

(2) To manage for naturally reproducing native fish stocks. In the long run such stocks provide more and better-quality fish than stocks raised in hatcheries.

(3) To give priority to native and established fish species over exotic species.

The importance of the Great Lakes fishery resource is recognized on the international level. The surrounding states, provinces and federal governments joined together many years ago to set up the Great Lakes Fishery Commission.

The Commission stresses that high-quality habitat is vital to high-quality fish communities. But the Commission and its member agencies agree that they have much to learn yet about restructuring fish communities effectively.

The Commission is working with other resource management agencies to ensure that the fishery resource receives consideration in the decision-making process and that the fish communities are recognized as indicators of environmental quality.

But what about the immediate plans for Pacific salmon in Lake Ontario? If the Ministry of Natural Resources can continue to collect viable eggs from Lake Ontario, and if such stocks are not infected by disease, the Ministry will continue to stock salmon until it is replaced in the fishery by native or established naturally reproducing species.

The Pacific salmon may be here on a temporary basis but their sojourn in Lake Ontario has taught us much and they have helped focus attention on a lake which has been ignored for too long.

Chinook salmon

Oncorhynchus tschowytscha

Chinook are stocked as fingerlings. They feed ravenously in the lake during their wide wanderings. They normally mature in their fourth year but some spawn a year earlier and others a year later. When they have spawned, they die.

Chinook may reach a weight of 36 kg (80 pounds) but so far the largest caught in Lake Ontario has been just under 18 kg (40 pounds).

In adults the back and upper sides are iridescent green to blue green; the sides are silvery and the underside silvery to white. The back has a few large black spots and the lower gums are definitely black. At breeding time chinook are olive brown to purple.

Coho salmon

Oncorhynchus kisutch

Coho are stocked in rivers in spring at the smolt stage, from 12 to 18 months in age and 10 to 18 cm (4 to 7 inches) in length. They reach Lake Ontario in several days and begin to feed ravenously on smelt, alewives and other small fish.

Coho wander widely. Some return in six months as jacks (precocious males) weighing about 1 kg (two pounds), but most coho spend two summers and a winter in the lake before returning to their parent stream. They may now weigh about 12 kg (25 pounds) or even more.

Adults have steel-blue or slightly green backs, silvery sides and white underparts. In the fall breeding males have dirty-blue-green backs and heads, reddish stripes down the sides, hooked snouts and enlarged teeth; their lower gums are grey to black.

Coho die after spawning but some linger on for weeks.

This is the moose that used to hang around Mr. Brubacher's barnyard.

The moose that came home with the cows

Report and photos by John Macfie
Fish and Wildlife Supervisor, Parry Sound District

BEFORE the exercise pictured on these pages, the Parry Sound staff of the Ministry of Natural Resources were as unschooled in, and apprehensive about, capturing and relocating a nuisance moose as just about everyone else. Now that we have done it, we want to share our expertise with other wildlife workers.

The yearling bull attached itself to a herd of beef cattle on a bush farm 10 miles south of Parry Sound last September. When the cattle came in from pasture in November, the animal began spending parts of most days hanging around farmer Abner Brubacher's barnyard, although it continued to retire to the surrounding forest to feed and rest. It wasn't much bother; it ate only token mouthfuls of Brubacher's hay, and was considerate of wire fences, which it took in stride, and other farm fixtures most of the time. But it had scratched the paint of a neighbour's car with its antlers and there was concern about a potential hazard to children. The moose had to go. It gave no indication of going voluntarily so it had to be taken.

We had "Cap-chur" tranquillizing guns, both the CO_2 pistol and the longer-range rifle. Experts at zoos and the Ministry's Wildlife Research Section recommended the drug "Rompun" for putting the moose down, and we had a supply of that in our bear disposal kit. Conservation Officer Bob Easton was appointed as marksman—the problem was in his management area and he also happened to be a good shot.

Conservation Officer Murray Rusk was handed the job of transporting the animal. Other Fish and Wildlife staff, and a generous contribution of men from other branches of the Ministry, were marshalled as herders to ensure the moose fell where Rusk could get at it with his assembled paraphernalia which included a truck, a front-end loader, quantities of rope, a helicopter cargo net and some bales of hay.

The first attempt left us with a groggy moose lying at our feet in the barnyard;

The nuisance is tranquillized, netted and hoisted for loading.

The passenger is relaxed.
—Photo by Joe Shoebottom.

The captive is released 40 miles away.
—Photo by Bob Easton

The exile sets out to occupy his new range.

during the course of two hours Easton had hit it with two well placed darts, each containing the prescribed 3 or 4 cc of tranquillizing drug, and the herders had twice retrieved it from the bush. The bull was down, but not out, and rather than risk injuring or overdosing it, we called off the attempt. The bull recovered and left—but only for a couple of days, not forever as hoped.

Next week, the re-assembled crew found the moose bedded down in the bush, and manoeuvered it into Easton's ambush. It took three darts loaded with a total of 10 cc of "Rompun" and a great deal of patient herding through field, forest and swamp to regain the position where we left off one week before—crowded around a woozy moose in Brubacher's barnyard.

It was now clear the darts just weren't delivering the goods, probably because those we used, which worked fine with bears, didn't have points of sufficient length to effectively penetrate a moose's thick hide and winter coat of hair. A booster shot of 2 cc of drug was administered by syringe and 20 minutes later the moose passed out. In the meantime ropes were attached to the bases of its antlers and it was led, at a snail's pace, a hundred yards to the waiting truck where it collapsed at exactly the right moment.

It was then a relatively simple matter to roll the limp body into a spread cargo net and hoist it into the back of the truck. It was a garbage truck borrowed from Killbear Provincial Park; its strong, tight steel box was tailor-made for transporting a large and unpredictable animal. The moose was propped on its brisket (to minimize the risk of pneumonia) with hay bales. Ear tags and a spot of orange paint which would be visible to an aerial moose census crew were applied. It was covered with a tarpaulin and the doors were slammed shut.

When they were reopened one hour later in moose country 40 miles to the north, the bull rose to its feet, stepped out and disappeared into the poplars. It left chewing on a mouthful of hay filched from one of the supporting bales.

We hope that is the last hay it ever gets to eat—we want to quit the nuisance-moose moving business with a perfect record.

Pigeons in the porticos

by Harold Jenkins
Wildlife Information Officer, Wildlife Branch

THE common pigeon of Ontario, which frequents office buildings in the city and silos and barns in the country, is not a native bird of Ontario. All the pigeons in North America are descendants of domestic pigeons which escaped after their owners brought them here from Europe along with their chickens, geese, ducks and other domestic poultry. Pigeons can fly and some just flew away.

The domestic pigeon is a relative of the European rock dove, so named because of its habit of roosting and nesting on the ledges of rocky cliffs. To our modern-day pigeons, who have returned to the life of their ancestors, a skyscraper or a house is simply another convenient rocky cliff.

The human residents of these latter-day cliffs often object to the presence of winged squatters. Pigeons are notoriously messy birds, soiling buildings with their droppings, and their untidy nests are little more than filthy and flimsy heaps of sticks and grass. The cooing of the adults and squealing of the squabs in the early hours of the morning is a further irritation to the people inside the buildings.

One wonders whether the early cave man in his cave had similar problems with the rock dove.

There is a long procession of things which have been tried in an attempt to discourage these unwelcome intruders. Everything from pinwheels and colored streamers to stuffed owls has been erected on balconies and window ledges, but the only permanent effect is to convince one's neighbours that one has bizarre taste in outdoor decoration. The pigeons soon learn that these items will not harm them and cease to react.

Pigeons are remarkably persistent in returning to a roosting or nesting site they have chosen. It seems ironic that the homing instinct can be so strong in descendants of birds which were so lacking in that characteristic as to wander away from some colonial dove cote.

There are no chemical repellents which can be used to discourage pigeons since birds do not react to foul smells as do mammals. Pigeons can be live-trapped but if they are taken away and released in the countryside, they will simply return "home". Moreover, other pigeons are likely to move in when the original inhabitants are gone. Whatever it is about the site that attracted the first birds will attract others.

Where pigeons build nests in nooks and crannies of houses they can be fenced out with chicken wire.

Pigeons will desert a roost in the presence of a live predator. The apartment that has a cat which is allowed access to the balcony will not have pigeons—at least not for long. This is admittedly not as colorful as keeping a peregrine falcon, which would be equally as effective, but you are more likely to have a cat. (Keeping a peregrine falcon is illegal.)

Whatever you do, don't trap pigeons for the pot, despite what you may have heard about tasty pigeon pie. This could have very unpleasant consequences since urban pigeons are carriers of infectious diseases such as the avian form of tuberculosis.

Simcoe County deer hunt

An experimental controlled deer hunt was held in Simcoe County November 5 to 7. Shotguns were the only firearms allowed and dogs were not used. Participating hunters had to obtain a special permit to validate their regular deer hunting licence. A total of 1,526 permits was drawn from 2,189 applications and an additional 140 permits (8.4 per cent) were issued to Simcoe County farmers. Simcoe County residents received 80.6 per cent of the special permits. An estimated 250 deer were harvested and the average success rate was 18 per cent. The three-day hunt provided 3,600 man-days of recreational opportunity and a considerable economic benefit to the local area. Hunters co-operated in returning more than 100 blood samples to be examined by veterinarians at the University of Guelph for diseases that are common to both wildlife and domestic livestock. A variety of other information was collected on 140 deer.

Gravelled cattle access adjacent to rehabilitated portion of creek.

Rebuilding Komoka Creek for trout

Report and photos by Robert Wenting
District Biologist, Aylmer District

IN DECEMBER of 1969, the upper 6 km of Komoka Creek were ditched so that two small parcels of land near the headwaters could be put into vegetable production. Most local people ignored this action but for the creek it was a tragedy.

Generations of anglers knew this creek, located just west of London, and enjoyed superb fishing for brook trout and the occasional rainbow. . .until the ditching in 1969. The banks were stripped of their stabilizing cover and the channel was gouged wider and deeper. The erosion and siltation increased. Brook trout catches became rare. The fishermen stopped coming.

Then, in 1975, compounding the damage, two drainage ditches were dug and connected to the creek, bringing in warmer waters and more silt.

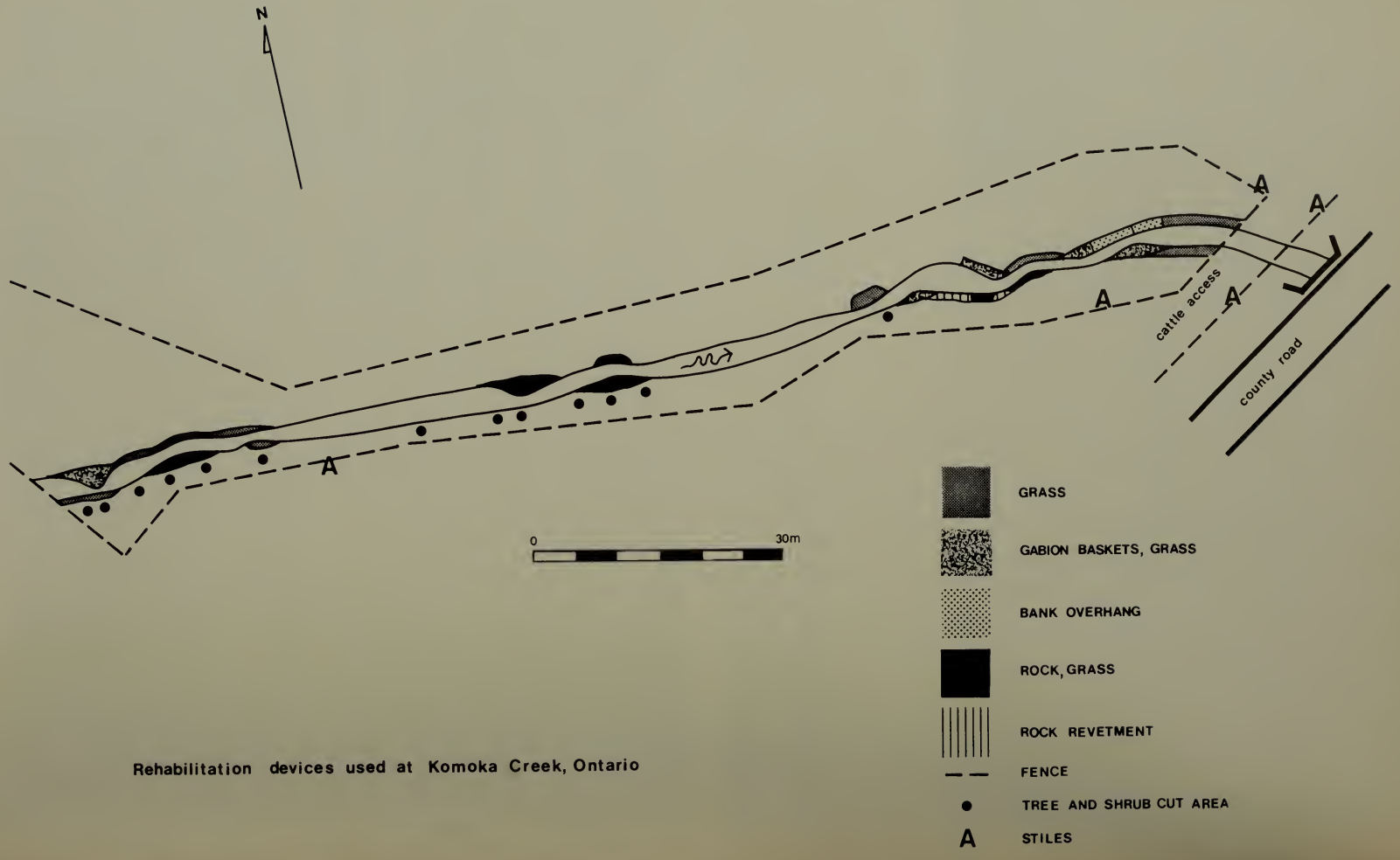
By 1977, the silting had extended beyond the ditched section and covered the existing gravel substrate. For the most part the streambank vegetation consisted of willow, dogwood or orchard grasses, none of which appeared to be effective in arresting bank erosion or providing trout habitat conditions.

In 1977, responding to the urgings of Jon George, fisheries technician, Aylmer District undertook the rehabilitation of the creek. Since 1974 Jon had been conducting a personal study of the creek and was convinced the trout habitat could be restored.

The rehabilitation was assigned to the district's extension biologist, assisted by two Ontario Career Action Program staff. Work began in early October with a sense of urgency because fall spawning would begin the following month.

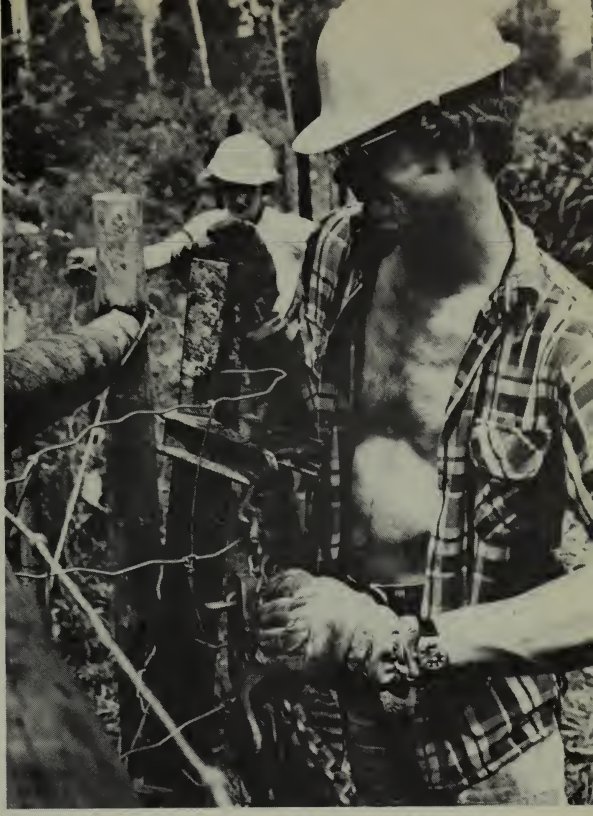
It was decided that work should begin where the silt loading seemed to stop—the idea being to work upstream, exposing gravel substrate and developing other habitat requirements. A triangle wing deflector and a submerged bank overhang were the first installations. These would expose gravel, narrow the channel, increase current flow and provide hiding cover.

The deflector consisted of four gabion baskets filled with nine metric tonnes of rock. The rock was gathered by hand, packed into nylon grain bags at a nearby gravel pit, transported by truck, and hand-carried to the site. Another tonne of rock



Rehabilitation devices used at Komoka Creek, Ontario

Bank overhang with rock and gravel top planted with canary grass.



Students fencing

was used to protect the upstream bank where the first gabion basket had been dug in. The top of the deflector was covered with gravel and silt taken from the creek bottom, and this was planted with clumps of reed canary grass taken from the banks of the nearby Thames River.

The bank overhang* was installed on the opposite bank of the creek, directly across from the deflector. A heavily-silted section of the creek (immediately downstream from the deflector) was stabilized by embedding a large quantity of broken concrete block into the silt, and planting clumps of reed canary grass on top of the watercress growing in the silt.

As a final action, and not wanting nature to take its own time, this section of creek was scoured of its silt load with a portable fire hose. An odd scene, no doubt—three Ministry personnel, pumping water from a creek back into the same creek—but in less than an hour the entire creek bed was cleaned to the gravel.

A week after the work was completed, a pair of coho salmon was observed constructing a redd (nest) just downstream from the deflector. Where days before silt had completely covered the gravel substrate, the large female coho was scooping out the gravel with a sweeping action of her tail, and then dropping eggs which her mate fertilized. The salmon were soon gone but the redd remained silt free.

In the spring of 1978, the deflector was found to have kept the creek bed relatively silt-free. The canary grass was growing well on the deflector, on the bank overhang, and on the silted section downstream. Here the channel width had been reduced a third, producing deeper water and a faster current.

In the following July, three more wing deflectors were installed upstream and the banks were stabilized. The deflectors were shaped and placed to increase current flow and expose more gravel substrate. About 14

** The bank was reinforced with rock, upstream and downstream from the overhang site. In front of the overhang, cedar posts were driven into the creek bed until their tops were 10 cm underwater. Support T-bars were lined up and hammered into the bank so that the end of each bar rested on a post top. Spruce planks were wired to the T-bars, weighted with rock and gravel, and planted with reed canary grass.*

Right—Komoka Creek, 1977.
Below, right—Komoka Creek, 1979.

tonnes of rock and gravel were used and each deflector was planted with reed canary grass.

By the spring of 1979, five rainbow trout redds were observed in the rehabilitation area. We thought happily "It works."

Work continued with the assistance of Experience '79 students, and stream habitat was improved a further 100 m upstream. Here fencing was necessary because the property owner wintered cattle on both sides of the creek. The landowner recognized the value of the project and signed an agreement with the Ministry, allowing the stream to be fenced and creating a Fisheries Agreement Area named after his farm.

A cattle access was built immediately below the rehabilitation area, graded to a shallow plane, and covered with gravel to prevent bank erosion. Five spruce-plank stiles were installed at strategic points to permit easy access to the creek.

Next, as an experiment in saving time, four of five new deflectors were constructed without gabion baskets. Rock simply was laid in a desired pattern in the creek bed and into the creek bank to just above the summer water mark. Large shrubs and small trees were cut and removed where their thick canopies prevented an understory growth of streambank vegetation. The exposed areas were planted with clumps of, or seeded with, reed canary grass.

In the hot and muggy weather of July and August, the endless trips for rock and canary grass was tedious work for the students. It was therefore gratifying to see them bring parents or friends to see the work they were doing. At rest breaks the students often caught grasshoppers and tossed them into the creek where yearling rainbows would take them in a flash.

The increasing interest of the landowner was evidenced by his frequent visits to the work area. More to the point, he built another restricted access to the creek where cattle in a feedlot had previously had unrestricted access.

The numerous installations created a varied current, meander and abundant cover. They appeared to have stabilized instream silting, exposed gravel substrate, arrested bank erosion, and increased the larval and adult insect populations on which trout feed. All this, we thought, should improve conditions for trout.

The first species to respond was coho salmon. Rainbow trout followed and we hoped native brook trout would also appear.

Opinion varies on the value of reed canary grass, an alien plant. It was used extensively on Komoka Creek because of its early growth, its resistance to various soil and moisture conditions, its strong root system which resists erosion and traps sediment, its cover for over-wintering trout, and its provision of adult insect habitat. While its growth could possibly choke a small creek channel, it was decided that, with subsequent maintenance an integral part of rehabilitation, its benefits favored its use.

The total cost of rehabilitating 152 m of Komoka Creek in three years was approximately $8,500 or $56 per metre. At that rate, it would cost $366,000 to rehabilitate the entire ditched part of the creek. One has to wonder how that cost compares with the cost of the ditching in 1969.

This commitment of time and money for stream rehabilitation on Komoka Creek, and on all the other streams being rehabilitated under the Ministry's Strategic Plan for Ontario's Fisheries, is commendable, but only if these streams are protected in the future. If the protection of our coldwater streams remains only the Ministry's concern —if the Ministry does not have the public's interest and support—these streams may yet be doomed.